

AACBIS
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of Brain Injury Specialists

CERTIFICATION EXAM PREPARATION COURSE
**Chapter 5: Understanding and Treating
Functional Impacts of Brain Injury**

MODULE OBJECTIVES

- Describe common cognitive, physical, emotional, behavioral, and social changes after brain injury.
- Describe how these changes affect the person's functioning.
- Describe the outcome-driven rehabilitation process.
- Describe and give examples of three environmental influences on behavior.
- Describe active treatment planning.

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INTRODUCTION

- There may be many changes in how a person thinks, feels, and acts after a brain injury.
- Cognitive, physical, behavioral and emotional changes can greatly affect a person's ability to live independently.
- These changes can affect virtually every aspect of a person's daily existence.
- Most people who have survived brain injury have impairments in several areas, which complicate living independently, working, and relationships with others.
- Changes in *behavior* after brain injury presents special difficulties.

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FUNCTIONAL IMPACT


- Cognitive impairments can affect activities of daily living
- **Memory problems** are considered to be the most disabling consequence of brain injury
- **Executive functioning** refers to the ability to plan, initiate, direct, and monitor one's activities and are often impacted
 - With impaired executive functioning, a person may not respond to stimulation from the environment in the same way as before a brain injury
- **Initiation problems** may result in a person failing to engage in an important activity unless prompted repeatedly.



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CHANGES IN THINKING

- Lack of awareness of deficits (**anosognosia**)
- Confusion about who one is, where one is, and the time (disorientation to person, place, and time)
- Distractibility
- Reduced ability to pay attention
- Difficulty with changes in routine
- Difficulty with basic calculations
- Difficulty with sequencing



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CHANGES IN THINKING CONTINUED

- Impaired ability to evaluate what is important versus trivial
- Relating information or events believed to be true, that have not happened
- Impaired ability to think abstractly
- Perseverative verbal behavior
- Difficulty understanding cause and effect
- Impaired safety awareness
- Lack of empathy
- Poor insight

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SPEECH AND LANGUAGE IMPAIRMENTS



- Speech and language problems can be either **Receptive** (the ability to understand others) or **Expressive** (the ability to express oneself to others)
- Common Deficits:
 - Impaired word-finding abilities
 - Repetition of words or phrases
 - Disorganized spoken or written communication
 - Incomplete or incoherent expression of thoughts

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SENSORIMOTOR IMPAIRMENTS

- **Localized** impairments: affect one extremity or side of the body
- **Generalized** impairments: affect most muscle groups and sensory modalities


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SENSORIMOTOR IMPAIRMENTS CONTINUED

- Decreased muscle tone (**flaccidity**)
- Paralysis of one or more limbs
- **Paresis** (weakness) in one or more limbs
- Balance problems
- Coordination problems (**ataxia**)
- Difficulty planning muscle movements (**apraxia**)
- Decreased endurance
- Increased muscle tone (**spasticity**)

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SENSORIMOTOR IMPAIRMENTS CONTINUED



- Vision problems
 - Depth perception
 - Involuntary eye movements (*nystagmus*)
 - Increased sensitivity to light (*photophobia*)
- Swallowing difficulties (*dysphagia*)
- Impaired hearing
 - Ringing in ear (tinnitus)
 - Increased sensitivity to sound (sonophobia)
- Impaired taste
- Impaired ability to smell (*anosmia*)
- Chronic pain
- Increased sensitivity to touch (tactile defensiveness)

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BEHAVIORAL AND EMOTIONAL CHANGES

- Delayed or unresponsiveness to requests
- Aggression
- Property destruction
- Depression
- Yelling and angry outbursts
- Self-injurious behavior
- Decreased frustration tolerance
- Impulsivity


- Decreased sensitivity to others
- Paranoia
- Inappropriate sexual behavior
- Hyperactivity
- Immature self-focused behavior
- Hoarding
- *Emotional swings* (affective lability)

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SUBSTANCE ABUSE

Immediate or delayed substance abuse can be related to any of the following factors:

- Re-involvement with friends who misuse substances
- Denial that substance abuse is a problem
- Poor coping strategies
- Limited therapeutic recreation outlets
- Limited vocational opportunities
- Pre-injury pattern of use of abuse
- Increase access
- Depression and isolation
- Increased awareness of limitations



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EFFECTIVE REHABILITATION

Effective rehabilitation involves:

- Identifying the *physiological* and *functional* changes that occur after a brain injury
- Identifying environmental factors that influence the individual's behavior
- Reducing unwanted behaviors
- Promoting *alternative skills* and *adaptive behaviors* to replace existing unwanted behaviors and to facilitate increased independence

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EFFECTIVE REHABILITATION CONTINUED

1. Identify important skills that an individual currently can:
 - Do independently
 - Do only with assistance
 - Not do
2. Help the individual develop a realistic *long-term plan*, including where and how to live upon discharge.
3. Determine what the individual needs to accomplish to achieve the plan.
4. Identify long-term goals.
5. Break long-term goals into specific short-term objectives.
6. Design a plan for helping the individual meet the objectives.
7. Evaluate progress on the basis of measurable outcome criteria.
8. Based on regular reviews of outcome criteria, revise Steps 1-7, as necessary.

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OUTCOME-DRIVEN REHABILITATION

- Treatment must be planned and provided within the framework of a systematic process.
- Results must be evaluated on the basis of specific *outcome criteria*.
- These outcome criteria are expressed in the form of therapeutic or life *goals*.
- Identifying outcome criteria is a critical step.



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OUTCOME-DRIVEN REHABILITATION CONTINUED



- When treatment planning is *outcome-driven*, the discharge site or the next setting is a primary focus for treatment planning
- The outcome or next environment varies among individuals.
- Not everyone may be able to return to independent community living and working.
- It is important to consider the individual's preferences. The *individual's choice* is a fundamental element of the treatment plan.


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DOMAINS OF FUNCTIONING




- **Mobility:** is the ability to move about, either by walking or with the aid of some form of assistive device such as a wheelchair, walker, or cane. A second aspect of mobility refers to the ability to transfer from one position to another.

- **Cognition:** refers to mental processes. This includes memory, attention, concentration, thinking, listening, judgment, decision-making, and awareness of the immediate environment including other people, places, and time.
- **Communication:** is broken down into two separate skills, receptive language and expressive language.




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DOMAINS OF FUNCTIONING CONTINUED




- **Health issues** include any factor that affects a person's physical well-being. Health issues may include a seizure disorder, respiratory problems, feeding difficulty, or bone or muscular complications.

- **Household management** includes meal preparation, housekeeping, money management, and other activities related to managing where one lives.
- **Community skills** are what enable someone to live and function safely in the community. They include getting around, using public transportation, shopping, eating in restaurants, and participating in recreational activities such as movies, concerts, or sporting events.



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DOMAINS OF FUNCTIONING *CONTINUED*




- **Self-help skills** include bathing, dressing, eating, grooming, and toileting (ADL).
- **Leisure skills** relate to the ability to use free time in ways that are not harmful (i.e., substance abuse, or other dangerous activities), including reading, television, music, and other activities done at home.
- **Vocational skills** refer to behaviors needed to get and keep a job. This includes everything from simple on-task behavior in a structured workshop setting to higher-level cognitive functions in competitive employment.

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ASSESSMENT

- Assessment is critical to effective treatment planning.
- The primary focus of assessment is to identify precisely how an individual's **strengths** and **weaknesses** relate to the expected discharge environment.



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ASSESSMENT *CONTINUED*




- Professionals from many disciplines are involved in the treatment of persons with brain injury including:
 - Behavior analysts, cognitive therapists, neurologists, neuropsychologists, nurses, occupational therapists, physiatrists, physical therapists, psychiatrists, psychologists, rehabilitation counselors, social workers, speech pathologists, vocational specialists, and others.
- Each professional assesses an individual's performance in the domains of functioning.

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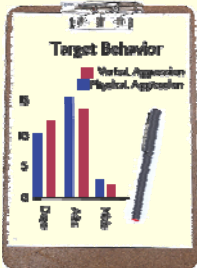
OUTCOME MEASURES

- Once assessments are done, the next step is to identify exactly what skills are needed for each desired outcome.
- In general, each outcome will have one or more *goals*.
- Each and every goal will have *behavioral* objectives.
 - *Outcomes* describe what performance is expected for success in the discharge site.
 - *Goals* break the general outcome criterion down into more specific activities.
 - *Objectives* further break down the goals into observable and measurable performance criteria that are taught in order.



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EVALUATION OF OUTCOMES



- Evaluation of *treatment effects* is a critical aspect of outcome-driven rehabilitation.
- Behavioral assessment:
 - Determines environmental factors that maintain the behavior
 - A-B-C assessment
 - Evaluates the effects of behavioral interventions
- Knowing what factors contribute to a behavior's occurrence is critical for understanding and treating behaviors.

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COMMON MEASURES OF BEHAVIOR AND PERFORMANCE

- **Frequency:** number of times that a skill or behavior is observed to occur
- **Rate:** number of times that a behavior occurs in a specified time period
- **Duration:** length of time that a behavior occurs
- **Latency:** length of time that it takes a person to initiate a behavior
- **Magnitude:** the intensity of a behavior
- **Percent of opportunities:** number of correct responses per opportunities to respond, times 100. It is used to determine responding when the opportunities to respond vary.

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EFFECTIVE TREATMENT PLANNING

The most effective treatment plan is:

- Tailored to the specific needs of the **individual**
- Developed based on the expected discharge site
- Developed based on the **expectations** of the individual and family
- Developed based on knowledge about methods for changing behaviors to improve performance



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STEPS TO TREATMENT PLANNING

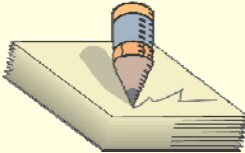


- Assess neuropsychological factors.
- Collect **baseline** data.
- Assess **environmental** influences (antecedents and consequences).
- Identify **positive reinforcers** to motivate and reward the individual.

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TREATMENT EVALUATION

- It is always important to evaluate the effectiveness of a treatment plan.
- Compare performance prior to the start of treatment (baseline data).
 - This is especially important to evaluate the effects of psychotropic and other medications.
- The **specific behaviors** that medication was prescribed for should be continually monitored to establish an ongoing need.
- Continuously monitor the behavior and make treatment changes accordingly.



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BEHAVIORAL TREATMENT METHODS TO INCREASE ADAPTIVE SKILLS

- **Task Analysis**
 - The overall skill is analyzed into components that can be taught and measured.
- **Shaping**
 - Reinforcement is provided only when a person gets progressively closer to the ultimate target behavior.


Task Analysis

1. Get toothbrush
2. Wet toothbrush
3. Apply toothpaste
4. Move toothbrush around teeth
5. Rinse mouth
6. Put away toothbrush and toothpaste

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BEHAVIORAL TREATMENT METHODS TO INCREASE ADAPTIVE SKILLS

- **Fading**
 - A gradual change from artificial to more natural cueing stimuli.
- **Incidental Teaching**
 - Many of the interactions between staff and individuals with brain injuries occur outside the structured program.



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ROLE OF THE BRAIN INJURY SPECIALIST IN TREATMENT PLANNING



Brain injury specialists are more likely to see individuals' daily difficulties and frustrations as they undergo rehabilitation because they spend time with individuals under the more natural conditions than other team members.

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ROLE OF THE BRAIN INJURY SPECIALIST IN TREATMENT PLANNING CONTINUED

- The brain injury specialist plays a critical role in:
 - **Evaluating** therapeutic effects
 - **Implementing** treatment plans
 - **Interacting** with professionals outside the facility, such as physicians
 - Meeting with **family members**
 - Many other aspects of rehabilitation

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GENERAL GUIDELINES FOR TREATMENT PLANNING

- **Person-centered:** Include the individual as much as possible, in the development and design of the treatment plan.
- **Supportive:** Design a plan that makes it very likely the individual will succeed.
- **Simplicity:** Make the plan easy for staff and the individual to understand.
- **Consistency:** Implement the plan consistently.
- **Flexibility:** Make the plan flexible enough to adapt to changes in the individual.



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INTERACTION GUIDELINES

- **Positive:** Only discuss the person's successes when the person is nearby.
- **Treat everyone with dignity and respect:** The most effective staff are those who treat people as unique individuals.
- **Don't talk down to people:** Persons in rehabilitation are people like you and I.
- **Stay calm:** It is most effective to stay calm during crisis situations.
- **Don't take things personally.**
- **Avoid arguments:** Little good comes from arguments.
- **Maintain a sense of humor.**




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UNDERSTANDING BEHAVIOR

- Human behavior is complex.
- Behavior is lawful and occurs for specific reasons.
- Behavior is controlled by the *human nervous system* and the *environment*.
- When brain functioning is altered by an injury, behavior can change.
- Altered behavior occurs as a result of *brain injury* and is further affected by environmental influences.

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NEUROLOGIC INFLUENCES ON BEHAVIOR




- When the brain is injured, the ability to *perform* certain tasks can be affected as can the ability to *control* unwanted behaviors.
- Damage to the *limbic system*, or *temporal lobes*, is often associated with aggression and other emotional responses.
- Damage to the *frontal lobe* can also result in inappropriate and emotional responding, as well as disinhibition.
- Problems with arousal and lethargy can be related to injury to the *brain stem*.

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ENVIRONMENTAL INFLUENCES ON BEHAVIOR

The environment consists of everything in an individual's immediate surroundings that can affect his/her behavior:

- People
- Stimuli
- Sounds
- Temperature
- Smells
- Lighting



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ENVIRONMENTAL FACTORS THAT INCREASE BEHAVIOR

General Behavioral Principles

Behavior will Increase	Behavior will Decrease
Reward (stimulus applied)	Extinction (stimulus removed)
Escape & Avoidance (stimulus removed)	Punishment (stimulus applied)

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ENVIRONMENTAL FACTORS THAT INCREASE BEHAVIOR

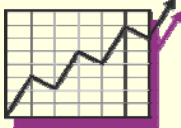
Rewards (positive reinforcement)

- Person receives preferred items, events, attention, etc., by behaving in a certain manner. Result: the behavior is strengthened or reinforced and more likely to be repeated in the future.

Escape & Avoidance (negative reinforcement)

- Person avoids or escapes an unpleasant situation by behaving in a certain manner. Result: the behavior is strengthened or reinforced and more likely to be repeated in the future.

Likelihood of Behavior Increasing



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ENVIRONMENTAL FACTORS THAT DECREASE BEHAVIOR

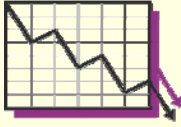
Punishment (negative consequence)

- Person receives an aversive stimulus (or event) or the removal of a preferred stimulus (or event) by behaving in a certain manner. Result: the behavior is weakened and less likely to happen again in the future.

Extinction

- Person no longer receives positive reinforcement by behaving in a certain manner. Result: the behavior is weakened and less likely to happen again in the future.

Likelihood of Behavior Decreasing



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TREATMENT PLANNING FOR UNWANTED BEHAVIOR




- Operationally define the behavior in objective and measurable terms.
- Establish a baseline level of the behavior.
- Assess the environmental variables that maintain the behavior.
- Identify specific methods for *decreasing* occurrences of the behavior.
- **Reinforce** desirable behaviors that can replace the unwanted behavior.
- Continue to evaluate the behavior's occurrence.
- Revise the plan as necessary.

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GENERAL GUIDELINES


- Emphasize strategies that teach *self-management* of unwanted behaviors.
- Use *least restrictive* methods when at all possible. Use more restrictive measures only after lesser methods have proved ineffective.
- Use the plan to teach *adaptive* behaviors that replace unwanted behaviors.
- Carry out treatment for behavior problems in all therapeutic contexts.
- Always attempt to be pleasant and positive when interacting with the individual



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TREATING SUBSTANCE ABUSE

- Traditional treatment strategies often do not work with people with cognitive impairments after brain injury
- Critical elements for effectively treating substance abuse after brain injury include:
 - **Trained substance abuse counselors** as part of the trans-disciplinary team
 - Comprehensive assessment of substance abuse upon entry to a program
 - Team should recognize the stages of readiness and willingness to commit to a sober lifestyle
 - **Family** involvement and group therapy are necessary for recovery
 - **Relapse** should be viewed as part of the recovery process, not as a failure



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GENERAL COMPONENTS OF EFFECTIVE PROGRAMMING

Whether treatment planning is aimed at increasing desirable skills, decreasing unwanted behavior, or both, *deficits in cognitive functioning* must be considered.

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GENERAL COMPONENTS OF EFFECTIVE PROGRAMMING CONTINUED

- These are the areas most likely to affect the success of treatment planning:
 - Memory: Forgetting critical events, appointments, or medications.
 - Executive Functioning: Poor planning, initiation, and attention
 - Language: Poor speech, articulation, etc.
 - Aggression, verbal outbursts, social skills
 - Employment: Difficulty recalling job, anxiety, etc.
 - Activities of daily living

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GENERAL COMPONENTS OF EFFECTIVE PROGRAMMING CONTINUED

- Daily planner
 - Treatment plans should include using a daily planner.
- Redirection
 - Redirect the person away from whatever is causing the *unwanted behavior*.
 - Changing the focus from the cause of agitation usually results in *reducing* agitated behavior.
 - Depending on the individual, it is often therapeutic to discuss the origin of an agitated episode after the person has calmed down.

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